AMENDMENTS TO THE CLAIMS

1 – 20   (Canceled)

21.   (Currently amended)   A system for transmitting multiple ~~data~~ frames, each frame having a header field and a data field, for ~~to~~ deep packet processing ~~functions~~ of the data field of each frame in a given sequence, performing the deep packet processing on the data fields ~~frames~~, and forwarding the processed frames to their destination in the same given sequence, comprising:

    a) an input buffer for receiving frames for processing, having a buffer capacity of at least twice the size of the largest frame size, said buffer incorporated into a Data Moving Unit;

    b) a Frame Header Processing Unit for determining the type of deep packet processing operation to be performed on each frame;

    c) a plurality of processing core engines wherein each core engine has its own deep packet processing operation to be conducted on the data field of a frame, and an associated memory for storing a frame assigned to the engine until the engine is free to perform a deep packet processing operation on the data field of the frame ~~data~~;

    d) an arbitrator for assigning an ascending frame sequence number to each frame and for forwarding each frame to one of the core engines for deep-packet processing;

    e) an output buffer for collecting each frame as it is processed by a core engine, said buffer having a buffer capacity of at least twice the size of the largest frame size and comprising a portion of the Data Moving Unit; and

    f) a sequencer for forwarding processed frames from the output buffer to their destination in the same order as they are received by the input buffer.

22.   (Currently amended)   A method of transmitting multiple ~~data~~ frames, each frame having a header field and a data field, to deep packet processing functions in a given sequence, performing the deep packet processing on the data field of

each frame ~~frames~~ and forwarding the processed frames to their destination in the same given sequence, comprising the steps of:

    a)   receiving frames into an input buffer that is incorporated into a Data Moving Unit, said buffer having a buffer capacity of at least twice the size of the largest frame size to be processed;

    b)   ~~determining the type of deep packet processing operation to be performed on each frame,~~ using a Frame Header Processing Unit to determine from the header field the type of deep packet processing operation to be performed on the data field of each frame;

    c)   assigning each frame to one of a plurality of processing core engines, based upon the processing operation to be conducted on the data field of the frame, each frame being stored in a memory associated with a core engine until the engine is free to perform the processing operation on the data field of the frame;

    d)   performing at least one deep-packet processing operation on the data field in each frame;

    e)   collecting the processed frames in an output buffer that is incorporated into a Data Moving Unit, said buffer having a buffer capacity of at least twice the size of the largest frame size to be processed; and

    f)   sequencing and forwarding processed frames to their destination in the same order as said frames are received into the input buffer.